

Penggunaan Zeolit Alam sebagai Katalis Teraktivasi dan Support Katalis dalam Proses Pembuatan Biodiesel (*Nature Zeolite Used as Activated Catalysts and Catalysts Support of Biodiesel Making Process*)

Pradiska Julianda Vebyola
*Renewable Energy Engineering Program
Departement of Engineering*

ABSTRACT

FFA content of residu oil which is used in this study reached 15.34%, so they need to go through the process of esterification. Esterification and trans-esterification process conducted by the addition of methanol and catalyst. This research using natural zeolit which more environmental friendly to reduced environmental pollution of the end product. This research used H-zeolite catalyst in the esterification reaction, while the catalyst of trans-esterification is KOH/zeolite 3% w/v oil and methanol 75% w/v oil for 2 hours reaction. H-zeolite is made by activating of natural zeolite using 6 M HCl and calcinated at 450° C. This research focused on the effect of the addition H-zeolite concentration and the duration of the esterification reaction to the yield of biodiesel produced. Esterification reaction is conducted by mixing methanol 20% w/v oil into 200 ml residu oil. This research using CRD (Completely Randomized Design) with 2 factors, concentration factor H-zeolite with 3 levels (2%, 6% and 10%) and the factor of time interval stirring esterification reaction with 2 levels (1 hour and 2 hours). The highest biodiesel yield reached 90.33% with A1B1 treatment (H-zeolite concentration of 2% and esterification reaction time 1 hour). Best biodiesel yield has a lot of characteristic such as density (0.862 g/cm³), flash point (163° C), cloud point (11° C), pour point (4° C). All of them are already suitable with ISO 7182: 2012 except viscosity testing (7.459 cSt) that exceeds the limit at 2.3 – 6.0 cSt distance.

Keywords : *Residu Oil, Nature Zeolite, H-zeolite, KOH/zeolite, Biodiesel*